SECTION 16140
WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawing and general provisions of the Contract, including General and Supplementary Conditions apply to this Section.

1.2 SUMMARY

A. This section includes the following:
   1. Wall switches.
   2. Receptacles.
   3. Device plates.

B. Related Sections: The following sections contain requirements that relate to this section:
   1. Section 16131, Boxes.
   2. Section 16196, Electrical Identification.

1.3 REFERENCES

A. National fire Protection Association (NFPA)
   1. NFPA 70-99, National Electrical Code.

B. National Electrical Manufacturer's Association (NEMA)
   NEMA WD 1-83, General Purpose wiring Devices.
   NEMA WD 6-88, Wiring Device Configurations.

C. Underwriters Laboratories, Inc. (UL)

1.4 SUBMITTALS

A. Products furnished from listed manufacturers are pre-approved but still require submittal.

B. Submit proposed substitutions for approval in accordance with General and Supplementary Conditions.

1.5 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Furnish products UL listed and classified as suitable for purpose specified.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver components in factory furnished boxes, crating and covering.

B. Store and handle components to prevent damage.

1.7 SEQUENCING AND SCHEDULING

A. Locate and secure components as shown. Install devices in the construction sequence so as to prevent damage to installed equipment.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Arrow-Hart, Bryant, General Electric, Hubbell, Leviton, Pass & Seymour, and Slater.

2.2 WALL SWITCHES

A. Wall Switches: NEMA WD 1; Specification-Grade, "1221" series, ivory finish, flush-tumbler type with operating mechanism totally enclosed in a molded urea or nylon composition case rated at 20 A at 125 V unless otherwise noted.

B. Provide "ac only" switches for alternating current circuits.

C. Provide "ac-dc T" switches for direct current circuits.

2.3 GENERAL PURPOSE RECEPTACLES

A. Receptacles: NEMA WD 1 and NEMA WD 6; Specification Grade, "5362" series, white finish, double wipe contacts, side/back wired, with nylon back and face, rated at 20 A at 125 V unless otherwise noted.

B. Enclosures: As indicated.

C. Mounting: Surface, recessed or floor, as indicated.

D. Provide caution signs for 480-V receptacles.

2.4 WELDING OUTLETS:

A. Hubbell, twist lock type, model #26410, 600 volt, 3 phase plus ground, 60 ampere, in box #26401 with 45 degree angled housing #26404, or equal. Only equals that exactly match the form, fit, function and electrical ratings shall be acceptable, any such equals for this item shall be submitted for approval with construction bid.

2.5 POWER OUTLETS:

A. 208 volt, 30 Ampere, 3 phase, 4 wire with ground NEMA L21-30R rated outlet.

B. Provide one cap per receptacle to the Contract Manager in original factory packaging.

2.6 COVER PLATES

A. Finished, flush mounted locations: White Nylon

B. Other Locations: Brushed, stainless steel.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify outlet boxes are installed at proper height.

B. Verify wall openings are neatly cut and will be completely covered by wall plates.

C. Verify floor boxes are adjusted properly to finished floor.

D. Verify branch circuit wiring installation is complete, tested, and ready for connection to wiring devices.

E. Verify openings in access floor are at proper locations.

3.2 PREPARATION

A. Clean debris from outlet boxes.

3.3 INSTALLATION

A. Install wall devices and plates after walls in area are finished.

B. Install extension rings on outlet boxes to extend flush with finished surface.

C. Install products according to manufacturer's instructions.

D. Install devices plumb and level.

E. Install switches with OFF position down.

F. Connect wiring device grounding terminal to branch circuit equipment grounding conductor.

G. Connect three-phase, four-wire power receptacles so that the A-B-C-phase sequence of the circuit is counterclockwise or in accordance with NEMA configuration.

3.4 FIELD QUALITY CONTROL

A. Check each wiring device for defects.

B. Verify each wall switch circuit is energized.

C. Verify proper operation of each wall switch.

D. Verify each receptacle device is energized with correct wiring connections.

E. Randomly check 120-V receptacles for proper neutral and ground wire connections.
   a. After installation, check for correct wiring by use of a Daniel Woodhead Model 1750 tester.
   b. After completion of wiring check, perform an "Equipment Ground Impedance Test" using a Daniel Woodhead Model 7040, "Ground Loop Impedance Tester." Maximum allowable impedance: 1.0 ohms. **Caution**: Test each receptacle with no loads plugged into other receptacles sharing the same equipment ground conductor.
   c. Check each receptacle for contact tension using a Daniel Woodhead Model 1760, "Receptacle Tension Tester." Minimum tension for current-carrying contacts: 20 oz. Minimum tension for grounding contact: 10 oz.
   d. Replace receptacles not satisfying requirements.

F. 208-V and 240-V Receptacles:
   a. Check receptacles for proper wiring with voltage tester, such as "Ideal" No. 61-055.
   b. After completion of wiring check, perform an "Equipment Ground Impedance Test" using a Daniel Woodhead Model 7040, "Ground Loop Impedance Tester," modified for l88 V through 260 V. Maximum allowable impedance: 1.0 ohm. **Caution**: Test each

receptacle with no loads plugged into other receptacles sharing the same equipment ground conductor.

c. Replace receptacles not satisfying requirements.

G. Power Receptacles

a. Check phase sequence by using a phase-indicating meter, such as Electro Mechanical Company, Inc., Oakland, CA, Cat. No. 4600. Check phase-indication meter against CM's standard meter.

b. Correct wiring for receptacles found incorrectly wired.

3.5 ADJUSTING

A. Adjust devices and wall plates flush and level.

3.6 PROTECTION

A. Protect finished device installation from damage from continuing construction activities.

END OF SECTION 16140